

(12) **UK Patent Application** (19) **GB** (11) **2 269 516** (13) **A**

(43) Date of A Publication 09.02.1994

(21) Application No 9312660.5

(22) Date of Filing 18.06.1993

(30) Priority Data

(31) 04231524

(32) 07.08.1992

(33) JP

04329273

09.12.1992

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(51) INT CL<sup>5</sup>

H04N 5/64, G06F 1/16

(52) UK CL (Edition M)

H4T TAFE

(56) Documents Cited

US 4525746 A US 4354206 A

(58) Field of Search

UK CL (Edition L) H4F FCW FJH, H4T TAFE

INT CL<sup>5</sup> G06F 1/00 1/16 1/18, G12B 5/00 9/00 9/02

9/04 H04N 5/64 5/655

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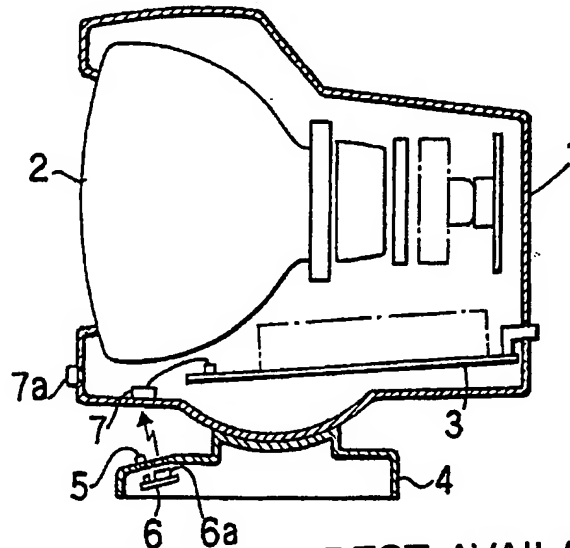
(54) Picture control switch mounted on tilt stand for display device.

(57) The display device has a picture control switch 5 located on a tilt stand which supports the display, and is arranged to transmit on-off information of the control switch by means of infrared ray signals toward an infrared light-receiving element 7 which is provided on the lower side of an outer housing structure 1 of the display. The information of the control switch is converted into electric signals by the light-receiving elements 7, thereby to adjust the condition of a picture image on the screen of the cathode ray tube according to the received on-off information.

Alternatively a cable is used to couple the control switch 5 to the display device (fig 4).

In a further embodiment (fig 3) the control switch may be mounted on a detachable remote control unit.

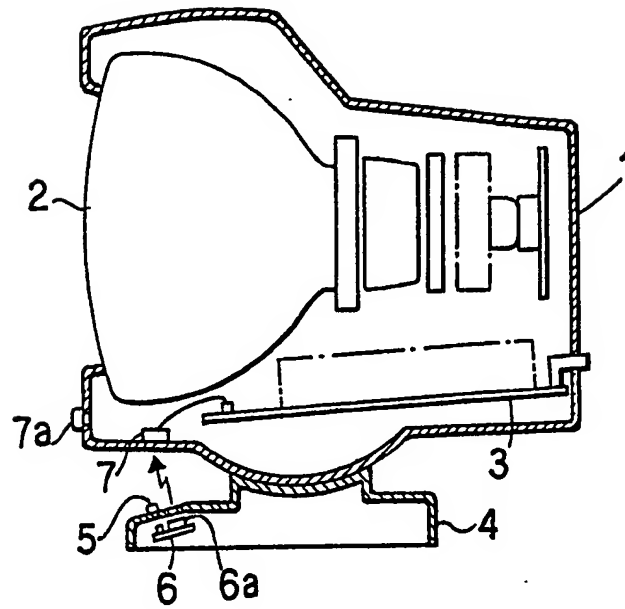
**F I G. 1**



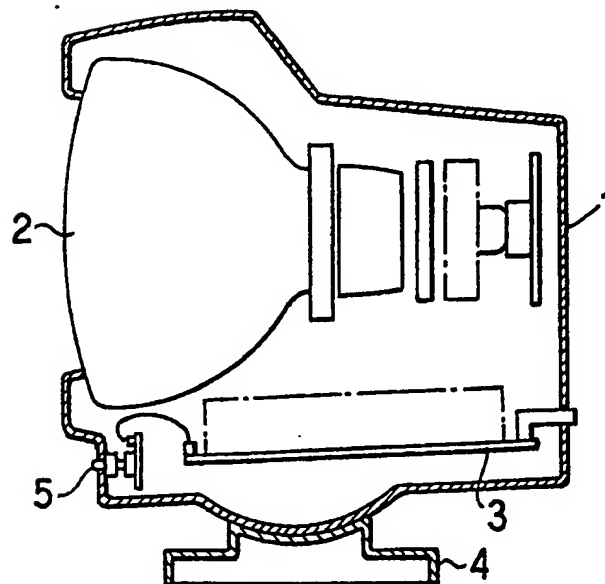
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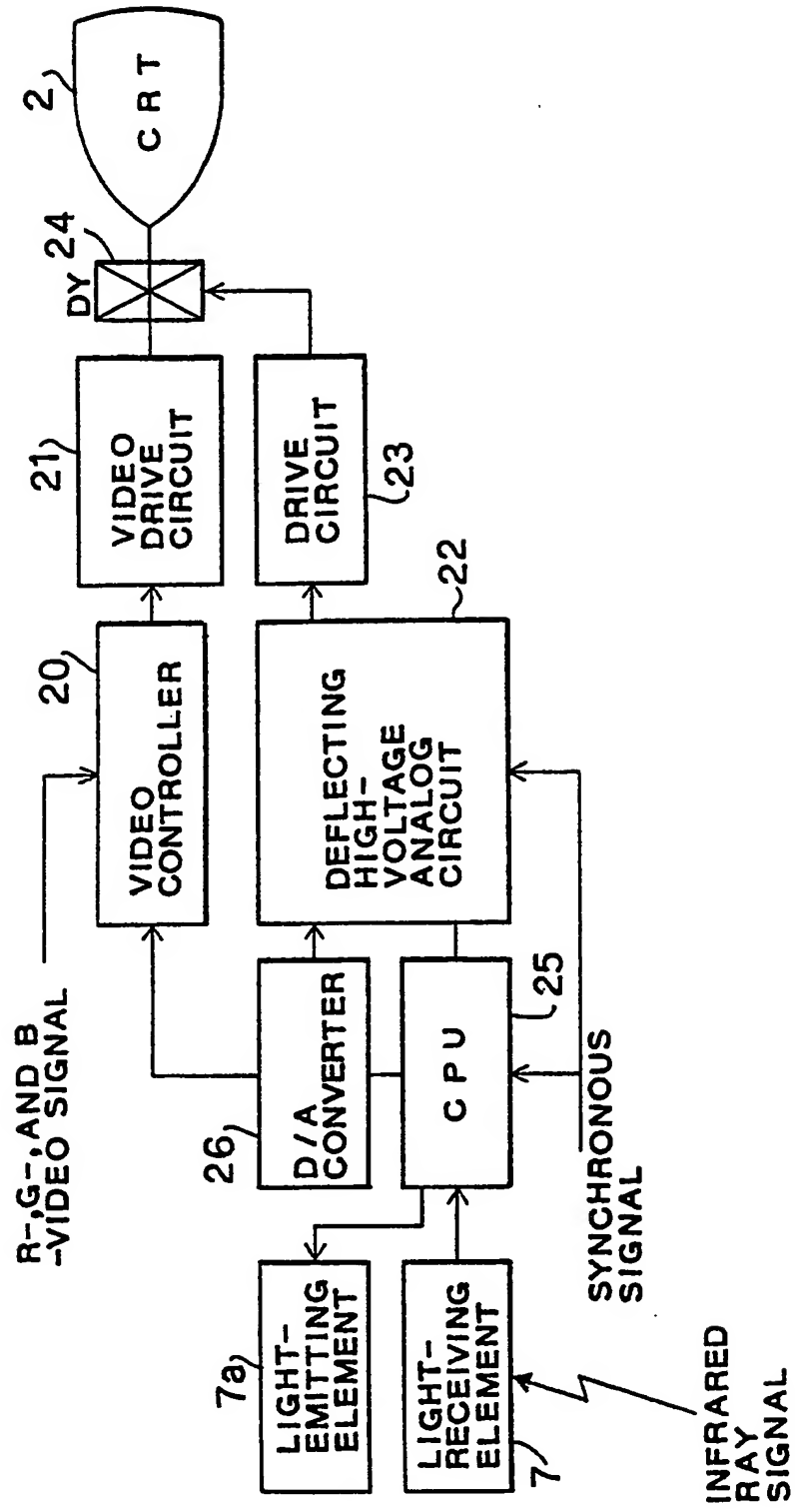
**FIG. 1**



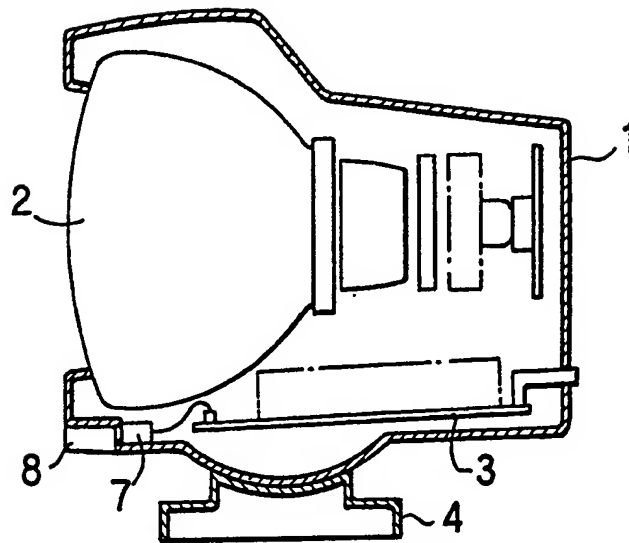
**FIG. 5**



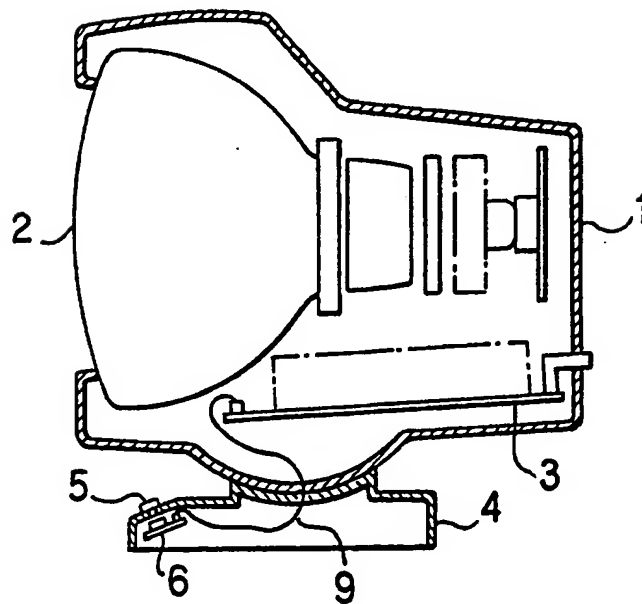
# FIG. 2



**FIG. 3**



**FIG. 4**



## DISPLAY DEVICE

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to a cathode ray tube type display device using a remote controled picture adjusting switch.

## 2. Description of the Prior Art

Schematically illustrated in Fig. 5 is a typical conventional display device, including an outer housing 1, a cathode ray tube 2 (hereinafter abbreviated as "CRT" for brevity) which is accommodated in the outer housing 1, a control board 3 which is mounted on the bottom of the outer housing 1, and a tilt stand 4 which supports the outer housing 1 such that the housing 1 can be tilted in upward, downward, rightward and leftward directions. Indicated at 5 is a picture adjusting control switch which is mounted in a lower portion on the front side of the outer housing 1.

The conventional display device of the above arrangement operates in the manner as follows.

The control circuit board 3, which is supplied with power on-off and video signals, converts them into signal forms which are necessary for displaying picture images on the screen of CRT 2. The position, size,

density and contrast of a picture image on the screen of CRT 2 are adjustable through the picture adjusting control switch 5 which is provided in a lower portion on the front side of the outer housing 1. The outer housing 1 which is supported by the tilt stand 4 is adjustable to turn the screen in the most suitable direction for the viewer or user.

The technology relating to the tilt stand which is capable of supporting a CRT outer housing such that the housing can be tilted in many directions is described in Laid-Open Japanese Utility Model Applications 63-185373 and 63-16767.

The conventional display devices, which have a picture adjusting control switch 5 mounted in a lower portion on the front side of an outer housing 1, have an inherent problem that the size of the display device as a whole has to be enlarged due to the necessity for sparing a relatively large mounting space for the picture adjusting control switch 5.

#### SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a display device which can be constructed in a smaller size despite the provision of a picture adjusting control switch.

In accordance with the present invention, for the purpose of achieving the above-stated objective, there is provided a display device which is arranged to transmit the on-off information of the picture adjusting control switch by remote control using infrared ray signals, permitting to mount the control switch on a surface of the tilt stand. Consequently, the present invention makes it possible to mount the space-taking control switch in a position other than within the outer housing box, thereby to downsize the display device as a whole.

#### BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

Fig. 1 is a sectional view of a display device according to an embodiment of the present invention;

Fig. 2 is a block diagram of a display circuit configuration for the embodiment of Fig. 1;

Fig. 3 is a sectional view of a display device according to another embodiment of the present invention;

Fig. 4 is a sectional view of a display device according to still another embodiment of the present invention; and

Fig. 5 is a sectional view of a conventional display device.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

Hereafter, the present invention is described more particularly by way of its preferred embodiments with reference to the drawings.

##### Embodiment 1:

Referring to Fig. 1, there is shown in a schematic sectional view of an embodiment of the present invention, in which the component parts common or equivalent with the conventional counterpart of Fig. 5 are designated by common reference numerals, and their explanations are omitted in the following description to avoid unnecessary repetitions. In Fig. 1, denoted at 6 is a remote control board which is mounted in a fore portion of a tilt stand 4 to generate infrared signals for picture adjustments. The remote control board 6 is connected to a picture adjusting control switch 5 which is mounted on a top surface portion on the front side of the tilt stand 4, generating infrared signals according to the operation of the switch 5. In this instance, infrared ray is employed as a signal source, so that there is no possibility of the on-off operation of the picture adjusting control switch 5 imposing adverse



effects on the picture images on the CRT screen.

Indicated at 7 is an infrared light-receiving element which is located on a surface portion on the lower side of an outer housing structure 1 in confronting relation with a light-emitting element 6a which is provided on the remote control board 6.

With the above-described display construction, one can adjust the position, size, density or contrast of a picture image on the CRT screen by operating the picture adjusting control switch 5. Namely, upon operating the picture adjusting control switch 5, an infrared signal is released from the light-emitting element 6a on the remote control board 6. This infrared signal is received by the light-receiving element 7, and converted into an electric signal to be supplied to an adjusting circuit on the control board 3 as an adjusting signal of a certain picture condition. As a result, the picture condition on the CRT screen is adjusted according to the operation of the picture control switch 5. Concurrently, the extent of operation is indicated by means of an indicator element 7a such as a light-emitting diode or the like which is provided on a surface portion on the front side of the outer housing 1.

Fig. 2 is a block diagram of a display circuit configuration for the embodiment of Fig. 1.

In Fig. 2, RGB (Red, Green and Blue) video signals from an external personal computer are fed to a video controller 20. These RGB video signals are forwarded to the CRT 2 through a video drive circuit 21. On the other hand, sync signals are fed to a deflecting high-voltage analog circuit 22 which produces beam deflecting signals corresponding to the RGB video signals. The beam deflecting signals are supplied to a deflection coil 24 of the CRT 2 through a drive circuit 23. As a consequence, the electron beam projected according to the video signals from the video drive circuit 21 is deflected by the beam deflection signals from the drive circuit 23 to produce picture desired images on the screen of CRT 2.

The sync signals are fed to CPU 25 as well as the deflecting high-voltage analog circuit 22. The CPU 25 which controls the video controller 20 and deflecting high-voltage analog circuit 22 on the basis of preset information. The picture adjusting control switch 5 functions, for example, to adjust the brightness and contrast of the CRT screen to a level favorable to the user. The infrared signals which are generated based on on-off operation of the switch are transmitted to CPU 25

through the light-receiving element 7. After that, the signals are fed to the video controller 20 and deflecting high-voltage analog circuit 22 through D/A converter 26 to adjust the brightness and contrast of the screen accordingly. While the picture adjusting control switch 5 is being operated, the light-emitting element 7a is lit on, and, if the switch is continuedly pushed on until the extent of adjustment reaches a maximum or minimum value of the adjustment, the light-emitting element 7a is switched into a blinking mode by CPU 25.

In the foregoing embodiment, the remote control board 6 which is connected to the picture adjusting control switch 5 is shown as being fixedly mounted on the tilt stand 4. However, the invention is not limited to such an arrangement. For instance, as shown in Fig. 3, the picture adjusting control switch and the remote control board may be integrated into a thin remote control unit 8 which can be detachably nested in a lower front portion of the outer housing 1. Alternatively, arrangements may be made to nest such a remote control unit detachably on a side surface of the outer housing structure 1 or on the tilt stand 4, to obtain the same effects as in the foregoing embodiment.

Further, although infrared remote control is employed in the foregoing embodiments for transmitting the operating signals of the picture adjusting control switch to the control board 3, there may be employed lead wires 9 to connect a picture adjusting control switch 5 on the tilt stand 4 to the control board 3 as shown in Fig. 4 to obtain similar effects.

As clear from the foregoing description, according to the present invention, the relatively space-taking control switch is located outside of the outer housing structure, thereby permitting to make the display device more compact and smaller in size as a whole.

CLAIMS:

1. A display device having a cathode ray tube, comprising:

an outer housing which accommodates said cathode ray tube therein;

a tilt stand arranged to support said outer housing such that said outer housing can be tilted in a plurality of directions;

a screen control switch operable to adjust conditions of picture images on the screen of said cathode ray tube;

a signal transmission means for converting on-off information of said control switch into an infrared signal and transmitting said infrared signal;

a signal reception means for receiving said infrared signal from said signal transmission means to reproduce said on-off information of said control switch; and

a picture condition control means for adjusting conditions of picture images on the screen of said cathode ray tube according to the reproduced on-off information.

2. A display device as defined in claim 1, wherein said control switch is provided on a surface of a front side of said tilt stand.

3. A display device as defined in claim 2, wherein said signal transmission means is provided on said tilt stand.

4. A display device as defined in claim 3, wherein said signal reception means is provided on a bottom surface of said outer housing.

5. A display device as defined in claim 4, wherein said picture condition control means is provided within said outer housing.

6. A display device as defined in claim 5, further comprising:

a light-emitting element provided on a front surface portion of said outer housing; and

a light-emitting element control means for blinking said light-emitting element when an extent of adjustment by said control switch reaches a maximum or minimum value of the adjustment and otherwise for lighting said light-emitting element continuously on.

7. A display device as defined in claim 1, wherein said signal reception means is provided on a front surface portion of said outer housing, and said screen control switch and said signal transmission means are integrated into a remote controller unit.

8. A display device as defined in claim 7, wherein said remote controller unit is adapted to

detachably nest on a surface portion of said outer housing.

9. A display device having a cathode ray tube, comprising:

an outer housing box which accommodates said cathode ray tube;

a tilt stand arranged to support said outer housing such that said outer housing can be tilted in a plurality of directions;

a control switch located on said tilt stand and operable to adjust conditions of picture images on a screen of said cathode ray tube;

a cable for transferring on-off information of said control switch; and

a picture condition control means located within said outer housing for adjusting conditions of picture images on the screen according to the on-off information transferred through said cable.

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